

## **LISTING OF CLAIMS:**

1. (Previously Presented) A process for separating acetaldehyde from methyl iodide by distillation, comprising the steps of:

distilling a mixture comprising methyl iodide and acetaldehyde in a distillation apparatus to produce an overhead and a residuum;  
measuring the density of said overhead; and  
adjusting at least one process variable associated with said distillation apparatus in response to said measured density or a relative concentration calculated therefrom, said process variable being selected from the group consisting of heating rate, column pressure, feed composition, reflux composition and reflux ratio.

2. (Previously Presented) A process for separating acetaldehyde from methyl iodide, comprising the steps of:

distilling a mixture comprising methyl iodide and acetaldehyde in a distillation apparatus to produce an overhead and a residuum;  
extracting the overhead with water to provide an aqueous extract and a raffinate;  
measuring the density of at least one of said overhead, said extract and said raffinate; and  
adjusting at least one process variable associated with said distillation apparatus or said extraction step in response to said measured density or a relative concentration calculated therefrom, said process variable being selected from the group consisting of a rate of heating said distillation apparatus, column pressure in said distillation apparatus, composition of the feed or reflux to said distillation apparatus, reflux ratio in said distillation apparatus, water feed rate to said extraction step, and combinations thereof.

3. (Previously Presented) The process of claim 2, wherein the density of the overhead is measured and the heating rate or reflux ratio is adjusted in response to said density or a concentration calculated therefrom.

4. (Previously Presented) The process of claim 2, wherein the density of the overhead is measured and the heating rate is adjusted in response to said density or a concentration calculated therefrom.

5. (Previously Presented) The process of claim 2, wherein the density of the extract is measured and the water feed rate to said extraction step is adjusted in response to said density or a concentration calculated therefrom.

6. (Previously Presented) The process of claim 2, wherein the density of the raffinate is measured and the water feed rate to said extraction step is adjusted in response to said density or a concentration calculated therefrom.

7-18. (Withdrawn).